CHAPTER 1

CHINA'S ECONOMIC DEVELOPMENT PRIORITIES

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INTRODUCTION

In the 1990s, we completed a survey of electronics and information strategies across Asia. We sent teams to Japan, Taiwan, Hong Kong, Singapore, Malaysia, South Korea, and China to observe their competitive developments in today's most dynamic industries. The results of those studies were published in a number of documents, including Electronic Manufacturing and Packaging in Japan (1995), Semiconductor and Electronic Manufacturing in the Pacific Rim (1997), and Information Technologies in the Development Strategies of Asia (1999). With the advent of the Internet, the speed of globalization, technological change, and the rapid informization of society, it was time to initiate a follow-up study. We decided that China should be the first of these updates since much had changed with the reunification of China with Hong Kong and Macau.

This study, though intended to cover a broad range of electronics manufacturing technologies is also intended to provide a discussion in which the context of change is taking place in China today. The move toward entry into the World Trade Organization will further change the basic rules in which Chinese industry is conducted in the future. The separation of Chinese government and military organizations from industrial activities will further change the look of the Chinese industrial landscape. The move towards a more "democratic" political system, in which city mayors are elected locally, is expected to continue to become more widespread in the future.

China is moving towards a mixed economy with economic reforms and decentralization of political controls. The government still directs heavy industries and is attempting to revitalize is largest state-owned enterprises. Developing and sustaining competitiveness in the face of global competition is going to be China's major challenge. It will depend upon:

- The degree to which the foreign private sector is allowed to enter the market and raise the levels of performance to global standards.

- The degree to which state owned enterprises (SOEs) are forced to transform themselves from politically controlled bureaucracies to dynamic managements focused on competitive quality, cost, deliver and service to their customers.

- The degree to which labor markets effectively allocates talent and skills into the needed business sectors.

- The degree to which capital resources are made available to the needed industries and companies.

The message of this chapter is that China presents much the same dichotomy as a typical American city: one a rich, rapidly growing suburb (China's control region) and poor, decaying core city (inland China and the Northwest).

GETTING THE GOVERNMENT OUT OF BUSINESS

Today's economic environment is driven by globalization, exploding technologies, information-intensity, and entrepreneurial behaviors. It requires:

- Free access to global information and markets.
- Protection of physical and intellectual property.
- People able to communicate and associate freely.
- A government with sufficient legitimacy to comfortably join the global economy.
- An educated population.
- A rules-based polity.

These requirements do not conform to a highly authoritarian system. They are driving political change in China.

With increased prosperity, China's leaders have struggled to create and refine the institutional, legal and commercial structures required by a modern economy, and to integrate China more fully into the international trading system. Chinese policy-makers are attempting to address challenges including: misappropriation of intellectual property, imposition of ad hoc taxes and charges, corruption, smuggling, frequent sweeping changes in laws and regulations, and the blurring of lines of authority among various national, regional and local power centers.

At present, China's political center includes about 200 un-elected, often elderly, men. They have decentralized responsibility for economic growth to local level, while controlling the hiring and firing of local and provincial officials. Both Zhu Rongji and President Jiang Zemin were previous Shanghai mayors. Shanghai Mayor Xu Kuangdi, one of the closest aids to Chinese Premier Zhu Rongji, has been in office since February 1995. They have centralized the collection of tax revenues and, more recently, the rationing of credit to the state sector. This model will likely become the core of China's future political system. It is not unlike that of Singapore, and Singapore is often China's model.

Premier Xhu Rongji's address to the Ninth National People's Congress in Beijing on March 6, 2000 outlined the basis for separating the bureaucracy from business activities. Zhu called for intensifying industrial restructuring, product quality and economic performance to make industry more competitive in the global environment. Restructuring key state-owned enterprises is intended to reduce the number and increase the size of surviving firms.[1] His latest policies include:

1. Reducing production by obsolete state-owned enterprises (SOEs) with non-marketable products.
2. Effective measurement to speed up technological upgrading of SOEs, with implementation of improved methods for quality and manufacturing.

[1] Premier Zhu Rongji, "We still fall far short of people's expectation," *Hong Kong Business*, April 2000, p. 19.

3. Vigorous efforts to develop high technology and emerging industries, particularly in the fields of information, bio-engineering, new energy sources, new materials and environmental protection; while China takes advantage of labor-intensive industries.

4. Industrial restructuring be continued to improve economies of scale and the optimization of distribution.

The new five year plan also has set its goals to raise tertiary industries' proportion of GDP, including information, banking and financial services, tourism, community services and intermediary services.[2]

SEPARATING MILITARY AND BUSINESS ACTIVITIES

The military had cashed in on the relaxation of investment and trade guidelines. In the mid-1980s, the military was given relatively free rein to forge business links with foreign companies wanting to do business in China. The People's Liberation Army (PLA) oversees a defense budget of about $40 billion, which includes a stockpile of nuclear warheads, chemical, and biological weapons, and ballistic and cruise missiles. By 1998, the PLA added an estimated 15,000 businesses, including airlines, hotels, and textile and pharmaceutical manufacturers. Officials estimated that PLA profits exceeded $1 billion per year. PLA-backed companies were accused of counterfeiting compact discs and software, and selling weapons of mass destruction to rogue countries. In July 1998, President Jiang Zemin ordered the PLA to relinquish its massive network of commercial enterprises. The Chinese president was attempting to stem the smuggling by PLA-run businesses – whose trucks don't pay tolls and don't get stopped by police.[3]

The People's Liberation Army and the paramilitary People's Armed Police (PAP) have indeed either closed down or handed over to civilian control most of the purely commercial enterprises covered by the divestiture order. According to a March 1999 article in the monthly magazine Shidai Chao, published by the official People's Daily, the PLA and PAP had transferred 2,937 businesses to the state and closed a further 3,928 by an initial deadline of December 1998. Of those, 82% had belonged to a single department of the PLA, the General Logistics Department. Among the enterprises handed over were some of the crown jewels of the military's business empire, including China's largest pharmaceutical company, 999, and the Xinxing Group, whose core business is trade in military supplies such as uniforms, tents and port equipment.[4]

But the same Chinese official also said that an early 1999 audit found the military had failed to declare approximately 10% of the businesses covered by the divestiture order. The civilian leadership set a second deadline of August 1999 for the PLA and PAP to hand them all in. By early this year, the official says, the number of businesses handed in had risen to 3,530, employing some 230,000 people.

"ONE CHINA" POLICY

Politically, the continued implementation of a "One China" policy focuses attention on Taiwan. The domestic pressure on China's leaders to make progress toward unification is strong, in large part through their own making. Since Hong Kong's return to mainland rule in 1997, and especially since the return of Macau in December 1999, the party has raised popular expectations by repeatedly stating that it has moved the recovery of Taiwan into a top place on its agenda. Official speeches and editorials on Taiwan policy routinely promise, as a May 22 *People's Daily* commentary did, that "the Taiwan issue will be resolved. The country's complete unification will be realized. We absolutely will not allow this to be delayed indefinitely."

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[2] Ibid.

[3] Tim Ito, Overview: Military, *The Washington Post (washingtonpost.com), July 1998.*

[4] Susan V. Lawrence, A model people's army, *Far Eastern Economic Review* (www.feer.com), July 13, 2000.

Premier Zhu Rongji made it clear to the world in March 2000 that the Chinese people were "ready to shed blood and sacrifice their lives to defend the sovereignty and territorial integrity of the motherland." They have also allowed the popular state-controlled press and government-backed scholars to engage in emotional discussions of preparations for war—naval blockades have been a favorite topic. That has "created an expectation at the lower levels that the senior leadership will do something" —possibly militarily—"because it hasn't been shutting off the venting of spleen."

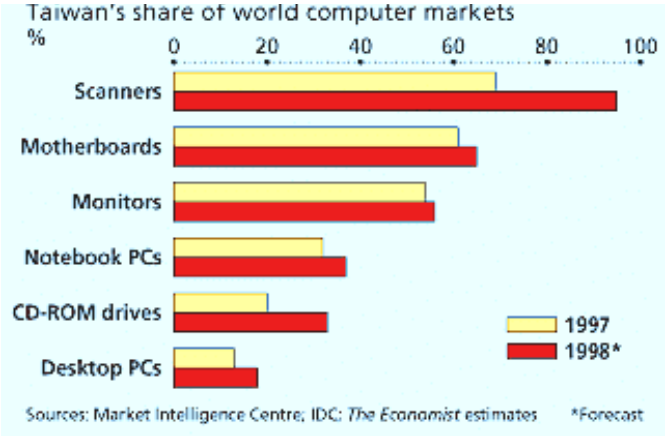
Many Chinese maintain that the Taiwan issue is tied up not only with the legitimacy of the party and the state, but also with China's fragile self-confidence as a nation. "When you try to modernize, especially as a developing country, you want to feel confident about yourself," Jia explains. "If you cannot even protect your own territory, how can you be sure you can modernize? How can you prove your leadership is viable?" [5]

Beijing's policies only favor high tech companies, with integrated circuit (IC) and software firms receiving the latest extension of tax incentives. However, the reunification of China and Taiwan raises more interesting implication for the world's electronics industry. Taiwan is a world leader in most of the critical components used in computers and Internet devices. For example, Taiwanese firms hold over 60% of the world motherboard market, 95% of the scanner market, 55% of the monitor market, and 40% of the notebook computer market. Taiwan holds a 12% market share in semiconductors, with TSMC being one of the world's leading semiconductor firms.

While Chinese firms will continue to dominate not parallel low-tech and medium level industries needed to supply its enormous domestic market, it is still short of capacity to supply the key components needed for more advanced products. China has a significant pool of engineering talent, and the ability to keep manufacturing wages low by tapping workers from the hinterland, as operations move into the impoverished West.

Failure to reform and privatize state-owned enterprises limits competitiveness in heavy industries and high technology industries. The closure of state-owned enterprises is putting pressure on government to improve the welfare system. The opportunities for corruption that will arise from state assets being stripped by officials and managers of state enterprises are also a cause for pessimism. Access to capital is a problem for all firms, but especially for entrepreneurial firms. The sale of state-owned enterprises is expected to provide the needed funds to establish a state-based welfare system.

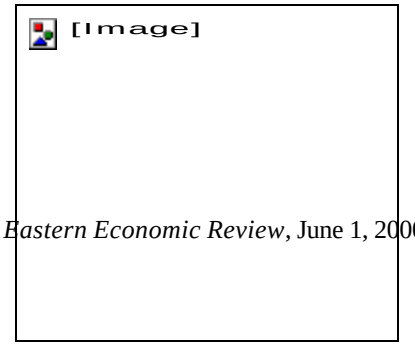
Figure 1-1: Taiwan's World Market Shares



PRIORITY 1: CONTINUE ECONOMIC DEVELOPMENT

China has become the world's second largest economy, surpassing Japan in the 1990s (Global Change Exhibit 1-1). The Government disbanded agricultural communes and allowed capital and (particularly) labor to move into low-end manufacturing. The Government moved out of the way to allow for growth. Double-digit growth rates created new jobs for workers made redundant by inefficient state-owned enterprises,

Figure 1-2: China's slowing growth



[5] Susan V. Lawrence, Cross-Straits Relations: Breathing Space, *Far Eastern Economic Review*, June 1, 2000.

migrants from the countryside to urban areas, and the hoards of young people looking for their first job from the growth of that huge population.

With a declining rate of growth (Figure 1-2), China is creating fewer new jobs. The first two decades of reform generated gains from allowing capital and labor to enter the low-end manufacturing and processing industries directed at export. The Government's role was to get out of the way.[6] Between 1992 and 1995, Chinese consumers spent 78 cents out of every dollar earned, saving 22 cents. As the Government continues to deregulate the economy, forcing state-owned enterprises to stand on their own, job security has become even more uncertain. Price deflation has resulted from savings rates rising as spending declines (Figure 1-2). Consumer spending fell to only 60 cents out of every dollar, leaving savings of 40 cents.

Table 1-1: Comparative Economic Statistics*

	China	Hong Kong S.A.R.	Taiwan	Singapore	South Korea
Country Size	4th largest country	N/A	N/A	N/A	N/A
Population	1236914658	6706965	21908135	3490356	46416796
Budget Expenditures	N/A	$ 14100000000	$ 55000000000	$ 13600000000	$ 101000000000
Budget Revenues	N/A	$ 19000000000	$ 40000000000	$ 16300000000	$ 101000000000
Economic Aid	$ 1.98 billion	N/A	N/A	N/A	N/A
Electricity Production	1135 billion kWh	28 billion kWh	125 billion kWh	21 billion kWh	174 billion kWh
Exports	$ 182.7 billion	$ 180.7 billion	$ 122 billion	$ 125.6 billion	$ 129.8 billion
External Debt	$ 131 billion	N/A	$ .08 billion	N/A	$ 154 billion
GDP	$ 4250 billion	$ 175.2 billion	$ 308 billion	$ 84.6 billion	$ 631.2 billion
GDP Agriculture	20 %	1 %	3 %	N/A	8 %
GDP Industry	49 %	16 %	36 %	28 %	45 %
GDP Per Capita	$ 3460.00	$ 26800.00	$ 14200.00	$ 24600.00	$ 13700.00
GDP Real Growth Rate	8.8 %	5.5 %	6.8 %	6 %	6 %
GDP Service	31 %	84 %	61 %	72 %	47 %
GNP	$ 1055.4 billion	N/A	N/A	N/A	N/A
Imports	$ 142.4 billion	$ 198.6 billion	$ 114 billion	$ 133.9 billion	$ 150.2 billion
Industrial Growth Rate	13 %	3.2 %	7 %	7 %	8.2 %
Inflation Rate	2.8 %	5.1 %	.9 %	1.8 %	5 %
Total Debt	$ 16.3 billion	N/A	N/A	N/A	N/A
Telephones	89000000	4370000	10010614	1400000	16600000
Televisions	75000000	1750000	10800000	1050000	93000000
Highways	118000000 total km	1760.00 total km	19701.00 total km	3010.00 total km	83400.00 total km
Military Expenditure	$ 91 billion	N/A	$ 4.03 billion	$ 17.4 billion	$ 11.5 billion
Military Percentage	N/A	N/A	4.3 %	3.3 %	3.6 %

***Sources**: This data is collected from the CIA World Fact Book, the World Bank and the International Monetary Fund for 1998

[6] *Survey China: Now comes the hard part*, *Economist*, April 8, 2000

After inflation hit 28% in 1994, government slowed the economy with the introduced a 17% value added tax for domestic transactions. Much of the government's economic policy since has been designed to avoid a recurrence of the inflation nightmare. China has memories of runaway prices in the late 1940s. Half a century on, it can be argued that Zhu Rongji and his economic team tamed inflation rather too brutally. Along with the Asian financial crisis came more stable prices by the late1990s. The drought and locust outbreak in 2000 has threatened to devastate agricultural output, which may lead to higher prices and food shortages. In addition, global petroleum shortages and related price increases could put further price pressure on the growing economy. This could lead to economic instability within China.

For China's leaders, a prolonged industrial slump and a restive population, demands serious structural change and market reforms. China's national economy is projected to continue to grow at rates over 7%. Shanghai, the business center that sets the economic trends for the nation, continues to grow at rates above 10%. Hence there continues to be a commitment to a private sector that breaks free from the state, to reforming the state sector, and to membership in the World Trade Organization (WTO). China's central government has committed itself to creating a market economy at home that is tied to the world at large. China's leaders understand that the Communist Party is history unless it can deliver growth. And for each of the past seven years now, economic growth has been slowing, risking dissatisfaction amongst the people. Even so, Zhu Rongji, the prime minister, has proposed that China become a freely elected parliamentary political system by 2030.

Zhu Rongji insists that new sources of growth must come from shrinking the state. The 15th Communist Party Congress in 1997 marked the start of this new phase with the suggestion that tens of thousands of small and medium-sized state enterprises would be cast loose upon private waters, to float or sink. In 1999, private sector guarantees were actually written into the state constitution. Membership in the WTO will prove as momentous a step as Deng Xiaoping's opening to the world in late 1978. China's closer integration with the world economic order will increase the pressure on it to become much more open, liberal and receptive. China's Minister of Foreign Trade and Economic Cooperation has published a list of policies that are intended to guide China's trade and investment activities under WTO (see www.moftec.gov.cn). All these economic changes will force profound changes in China's political system and its society generally.

Financial Reforms

An overhaul of the tax system in 1994 gave the central government the ability to collect revenues from the provinces. Annual revenues are now equivalent to 13% of GDP (compared with 31% for America).[7] China's central bank, the People's Bank of China, use to operate like other state enterprises with branches in every local area to support the pet projects of local party bosses. The central bank has now been reorganized into nine regional branches. The central bank monitors branches of the four state banks, which provide credits to local state enterprises.

In January 2000, the governor of the People's Bank, Dai Xianglong, an ally of Premier Zhu Rongji, told the state banks that "they had had their last dinner." The state bank's non-performing loans are 1.2 trillion yuan, or equivalent to 15% of GDP. The government's outstanding debt equals 20% of GDP. There are some estimates that it could be double that amount. The loans are being put into asset-management companies to restructure, repackage and sell over a period of ten years. The government hopes it can recover almost one-third of the bad loans, a questionable goal.

China's annual tax revenue (of which nearly one-fifth goes on paying interest on government debt) is its main asset. In all, the government's liabilities are approximately 100% of GDP. Government debt is expected to peak at 60-70% of GDP, a high but still manageable level. But should bad loans increase or tax revenues stagnate, the debt ratio could spiral out of control. The sale of state enterprises is considered one possible source of additional revenues, but in a socialist country there are still intense ideological objections to selling control of telecom, energy and transport companies. China's under-invested railroads and urban-transport

[7] *Survey China: Whatever it is, we cant afford it*, *Economist*, April 8, 2000.

networks will be difficult to sell. China Telecom raised $3 billion in Hong Kong over two years ago, and its shares have since soared. It is a company in a growing, forward-looking business, without a pension legacy, and with a near-monopoly position. China Unicom, China's second largest telecom provider, raised $5 billion on the New York Stock Exchange in June of 2000.[8] In total, by June 2000, China held $158 billion in foreign exchange reserves.

The cost of state workers' pensions is projected to reach 50% of GDP. This has affected strategies for raising capital. For example, PetroChina, seeking to float a minority stake on the New York Stock Exchange, lost the support of fund managers when it disclosed that funds would be used to pay pensioners.

PRIORITY 2: CREATE NEW JOBS

The country's 1.3 billion people make up one-fifth of the world's population, but they live on only one-fifteenth of the world's land. In fact, because a large part of China is inaccessible and inhospitable, the density in the main population centers is much higher than those figures suggest. Two-thirds of mainland Chinese live in the fertile eastern fifth of the country. China has 31 provinces, including the four municipalities with province-level status and the five autonomous regions (like Xinjiang and Tibet). In addition, Hong Kong and Macao are special administrative regions with closely policed territorial borders with the motherland.

By land area, the biggest province is Xinjiang, three times the size of Spain. China's largest city, Shanghai, has a 15 million population; five times the population of Singapore. China's most populous province, southern Sichuan, has over 110 million people, nearly 85% as many as Japan. Guangdong, Hubei, Anhui, Hunan, Hebei, Jiangsu, Shandong and Henan each have between 59 million and 93 million people, comparable to countries like France and Mexico. The Guangxi Autonomous Region, with 46 million people, is more populous than Poland.

The scope of China's development problems is difficult to fathom. The productivity of the land and the two-thirds of China's 1.3 billion people that still live in the countryside has almost reached its natural limits, given China's severe shortage of water. The central government has proposed a $12 billion pipeline to carry water from the Yangtze River to the northern areas. Higher productivity in agriculture will come at the price of 8 to 10 million people a year leaving the land for urban areas—and those jobs will need to be created. Another 6 million jobs are needed to allow for the modest natural increase in the urban population each year. In addition, 4 to 7 million a year are being thrown out of work by shrinking state-owned enterprises. The total is a minimum of 18 million urban jobs that the economy must create every year for the next few years.

[Image]

Figure 1-3: China's deflation

In a socialist country, the problem of unemployment is down played. That is why China's official unemployment rate is only 3.1%. The feudal state-enterprise has traditionally paid the employee's salary, provided their flat, sent their children to a company-run school, put them in a company hospital when ill, paid their pension and even provided burial services. Since 1995, the system has been breaking down. State-owned enterprises, the 1997 Party Congress decreed, had to sharpen themselves up for the market, and that meant optimizing their workforce (i.e., sacking large chunks of it). The state banks reinforced the message by starting to cut credit. The phrase *xia gang* refers to people who are sent home on nominal pay, though not yet officially sacked. Similar euphemisms are used for people whose jobs have evaporated or are waiting for work; early retirees; and those absent from their posts.

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[8] Lester J. Gesteland, *China Unicom IPO exceeds expectations: closes at US$22. ChinaOnline News*, June 21, 2000.

The Prosperity Gap

Although China's communist leaders have had two decades of growing prosperity, mainland Chinese want to be like the more prosperous Chinese in Hong Kong or even like the Japanese. The national average per capita income (excluding Hong Kong and Macau) was $735 at 1998 prices, which makes China somewhat poorer than Indonesia. That average, though, conceals great regional inequalities (Figure 1-4). In 1999, GDP per capita in the West fell to 4,300 renminbi ($520), or just 40% of the level in the East - down from 56% in 1983.[9] The poorest province, Guizhou, has a GDP per head of $280, on a par with Bangladesh or Yemen. Sichuan, with a figure of $525, is level with Pakistan. Meanwhile, Shanghais residents, at $3,400, are up there with Turkey or South Africa. However consider Hong Kong, which at $22,990 has a higher per-head income than Britain, its former master. The typical commuter on the Hong Kong Star Ferry is likely to be 90 times wealthier than the vegetable-seller in Guizhou.

Under national legislation, overtime should be paid at a rate of 50% above that for normal hours, and be limited to 36 hours a week. But the migrant girls in Guangdong factories are generally worked for 12 hours a day, six days a week. With that, young working women from the countryside make between 500 RMB ($62 at Whitways) and 1000 RMB ($125 at Namtai) per month, depending on the location and company.

Regional inequalities are a serious matter for Beijing's leadership. Equally serious is the wealth gap between city and countryside. In cities, 90% of households have washing machines and color televisions. On farms, the most widely owned consumer durable is the sewing machine, found in 70% of all households.

Figure 1-4: China's Income Gap

[Image]

In spite socio-political concerns, China's industry continues to grow. Suzhou in Jiangsu Province, and Xian in Shaanxi Province are targeted to become super cities comparable to Shanghai and Beijing. Some $20 billion was budgeted for the Suzhou Industrial Park, with plans for 600,000 people to move in. Installation of water treatment and power plants were supervised by the Singapore government. Some 220 Chinese officials were trained in Singapore to administer the industrial park.[10] To date, the project has been less than successful, but continues its development. Xian will not receive the next major infusion of government investment as the basis of moving economic development further west.

Growing Unrest

Much of the new unemployment is in the northeastern provinces of former Manchuria, where most of the old heavy industry is concentrated. The almost feudal dependence of the urban proletariat on its state-enterprise employer is hard for westerners to comprehend. According to a study of unemployment in north-eastern by Antoine Kernen and Jean-Louis Rocca (published in *China Perspectives*), Liaoning had an urban working population of about 12 million in 1995. The authors calculate that in the West about 329,000 of these would be classified as unemployed, including young people looking for their first jobs. By the end of 1996 that unemployment total had risen to 800,000; by the end of 1997 to 1.8 million; and by the end of 1998 to 2.2 million, or 18% of the labour force. It is no doubt very much higher today, if only because 400,000 people were officially scheduled to be laid off in 1999 and 2000.

In the northeast, strikes, sit-ins, petitions and even factory occupations have multiplied. Yet the unmanageable social unrest predicted has not yet materialized. That may be because, despite the lack of jobs, this urban proletariat is better off than it appears at first sight. For a start, almost all of these new poor keep

[9] Bruce Gilley, Saving the West, *Far Eastern Economic Review*, May 4, 2000, p. 22.

[10] Ibid.

their state housing. And where state enterprises are walking away from their welfare role, municipal governments are stepping in to organize retraining and to find jobs for the locals.

But unemployed state workers are tied to one place by their housing, their welfare arrangements and their hope of a new job. In the Northeast, strikes, sit-ins, petitions and even factory occupations have multiplied. Impoverished and demoralized state-industry workers are attacking their Communist Party managers, looting their own factories and taking to the streets in protest. In a startlingly frank series of recent articles in the journal of the Ministry of Public Security, senior police officers say they expect the unrest to worsen as lay-offs and factory sell-offs and closures continue.

In Fujian, police chief Chen Youcheng reported that state-enterprise workers in his province staged 31 mass protests in the first half of 1999, up from just four in the first half of 1998. Anhui province in central China logged 5,156 cases of theft from state-owned enterprises in the first nine months of 1999. Dai Shaoqin, a senior police official from Anhui, reported that it's now common to see "workers collectively besieging enterprise leaders, hurling abuse at them, and even detaining them under duress." Angry workers at the struggling Huainan Mining Corp. have physically attacked low-level managers no fewer than 60 times in the last three years, he says. In February, some 20,000 people revolted in the remote northeastern town of Yangjiazhanzi following the closure of a state-owned mine. Dai states that young workers in failing state factories steal raw materials and machines and sell them to illegal metal merchants and the privately run steel-rolling mills that now operate outside many state-owned factories and mines in the province.[11] The short-term solution of industrial unrest in China, observers note, is to disburse more cash to sidelined and laid-off workers. In the long term, the answer is to speed up development of the private sector.[12]

The Search for Jobs

Villagers in the countryside are looking for work in the local township and village enterprises, quasi-collectives that thrived in an unregulated environment; or they have made their way to the coast to work in the processing plants of foreign joint ventures, or in factories like those at Guizhen. The migrants to the cities, such as the Henan rubbish collectors in Beijing, live a life on the fringe of urban society. They do the menial jobs as janitors, street-sweepers, etc. that the laid-off workers from state enterprises refuse to take. In Beijing the construction workers are from Shandong province. The nannies are from Anhui or Hunan. The rubbish collectors are from Henan. And the prostitutes are from everywhere.

Nobody knows exactly how many economic migrants there are, but the number is huge: estimates range from 80 million to 130 million, and still growing. Their presence in cities is a measure of how controls over people's movements have loosened. But migrants still lack many privileges conferred on urban residents by their *hukou*, or household registration. Without a *hukou*, for instance, they cannot get access to schooling, health care or housing. That is why migrants rarely bring their families with them when they seek work in the cities. The Government uses harsh measures to control this migration. Before the celebration of China's 50th anniversary of the People's Republic, 300,000 migrants including beggars, prostitutes, drivers of three-wheeled carts, children and the mentally ill were expelled from Beijing.

Inland Development

Developing China's inland regions is one of the most pressing tasks for the central government. The state statistical bureau reported per capita income in Hohhot, a city in Inner Mongolia, at $362 in 1995 compared to $1411 in Shenzhen, the special economic zone in Guangdong Province. In central China, like Gansu Province, the average household income is only $60 per month. This disparity results from heavy foreign investment along the coast near Hong Kong. Improvement of the economics of western and central regions in China has become a top priority since 1996. Of the $38 billion in foreign direct investment (FDI) in 1995,

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[11] Susan V. Lawrence, Mercury Rising: Police officials acknowledge a growing problem of unrest among state workers, Far Eastern Economic Review, April 27, 2000.

[12] *Survey China: Country cousins*, *Economist* April 8, 2000.

over 80% was invested in coastal cities, with only 10% going to rural areas. The central government hoped to raise the percentage of FDI in western and central regions from 12.7% ($4.29 billion) in 1994 to 20% ($8.5 billion) in 1996. The government plans to channel investment inland from various coastal sources to defuse the discontent of regional governments in poorer regions. A plan has been developed for government municipal enterprises in coastal regions to invest in the interior. The next five-year plan budgets nearly 60% of government investments for the inland regions. This, of course, causes concern for the coastal cities that represent nearly two-thirds of the population.

Communes transferred control of municipal enterprises to cities, towns and villages as China moved from a planned to a market economy. Municipal enterprises have benefited from special tax incentives and other favorable treatment. They suffer less government interference in their operations than state-run companies. According to the Ministry of Agriculture, about 250,000 township enterprises exist nationwide with total output almost worth half the production of state-run enterprises. More than 1,000 township enterprises have even taken their investments overseas. Nanjing City officials announced that by the end of September 2000, restructuring will be completed at more than 90 percent of the state-owned small- and medium-size companies in the city's industrial sector. Nanjing plans to sell 80 percent of these companies' state-held shares.[13]

The National People's Congress in Beijing made Chongquing one of China's four nationally controlled cities, instead of a provincial city under Sichuan province. This is the same status as Beijing, Tianjin and Shanghai. Chongquing has a population of 15 million, of which 11 million come from the surrounding countryside. Only $700 million of the $100 billion invested in China has reached the city. Cheap labor costs about 2 yuan (25 cents) to carry 20 kilos (44 lb) for 20 minutes. Chongquing has responsibility for resettling one million people being displaced by the Three Gorges Dam project 410 miles down the Yangtze river. The city was also given administrative authority over two neighboring cities, adding another 15 million people. A new highway puts the city only four hours away from Sichuan's more prosperous capital, Chengdu. Chengdu is also one of western China's electronics centers.

Xian, Chongqing and Chengdu have relatively well educated workforces, since China's restrictive policies on employment mobility have prevented many qualified workers from moving east. Three sectors in which FDI is expected to grow include electronics, automotive components and machinery processing. Investors are expected to be able to tap the strengths of the old military enterprises and benefit from the proximity of raw materials in the West.

PRIORITY 3: INCREASE FOREIGN DIRECT INVESTMENT

Zhang Xiaoqiang, director of foreign investment utilization under the State Development Planning Commission, announced at the APEC 2000 China forum that China had a new package of policy incentives for implementation of the strategy of developing the western region. To attract more overseas funds into the country's central and western regions, more areas will be opened to foreign investment and restrictions will be eased. Foreigners investing in "encouraged fields" will enjoy preferential treatment when importing equipment and technology. China now encourages foreign investors to enter sectors including transportation, power, petroleum and natural gas, urban infrastructure construction, the development of mines, and the restructuring of the machinery industry. Foreign investment in the retail sector will be extended to the capital cities of western provinces and regions in the near future, and insurance, telecommunications, and yuan banking business will also be gradually opened to foreign investors. Zhang also pledged that more sectors would be opened to foreign investors in western China. [14]

The central government will also add more funds to hasten economic development in areas in central and western China. In the future, 60 percent of the country's budgeted basic construction capital and 60 percent

[13] The *Zhongguo Xinwen She* (Chinese Overseas News Agency) reported on June 19, 2000.

[14] *MOFTEC News*, May 31, 2000.

of the loans from policy banks will be used for infrastructure construction, environmental protection, and science and education projects in these regions. The central government will direct more preferential loans from international organizations, such as the World Bank and the Asian Development Bank, to the central and western regions, increasing the amount for these areas from 60 percent to 70 percent. In addition to traditional joint venture, cooperative firms, and solely foreign-funded firms, China will introduce other channels for foreign funds in the western region, including Build-Operate-Transfer (BOT) projects, project financing, stock issuing, and the setting up of industrial funds and venture capital.

Since 1993, China has for six years been the second largest recipient country of foreign direct investments (FDI) after the USA. By the end of 1998, China had approved 324,000 foreign invested projects. These projects have a combined contractual FDI of US$572.5 billion, of which US 267.4 billion has already been used. The Chinese foreign investment laws (CFILs) have encouraged the development of FDI in China. The legal developments of FDI admissions have affirmed China's open attitude, which provide better investment environments for foreign investors, and meet China's needs for further reform and wider opening to the outside world.[15] Some previously restricted industries, for example, have been opened.

- The government now permits the foreign insurance companies to set up businesses in Shanghai and Guangzhou. By April 1998, 11 foreign-funded businesses had been approved with 180 liaison or representative offices also being opened.

- Five Sino-foreign trading equity joint venture companies were approved by the central government by October 1998. Such ventures are still restricted and require that the majority ownership be Chinese.

- FDI is now restricted to majority Chinese ownership in construction and operation of trunk railways.

- With majority Chinese partners, FDI is encouraged in construction and operation of branch and local railway lines, and the associated bridges, tunnels and ferrying facilities, the production and operation urban underground trains and light rails, the construction and operation of roads, independent bridges and tunnels, and construction and operation of ports public utilities, and the construction and operation of civilian airports.[16]

China has provided new policy incentives and market access to attract more FDI. The policies aim to encourage FDI in technological innovation, provide stronger financial support to foreign invested enterprises, and encourage FDI to expand into central and west China.[17]

- All existing FDIs in target areas will receive wider tax exemptions when they import equipment, technology, and components to upgrade their production facilities.

- FDI enterprises are exempted from paying income tax when they acquire locally made equipment to upgrade production facilities or high tech products. They will also receive VAT rebates on locally made equipment, sales tax exemptions on technology transfer or resultant profits (with tax bureau approval). Exports for plants established before the end of 1993 are tax exempt.

- FDI in the west will enjoy full exemptions on import duties, including new industries. Firms that expand into the central and west regions will receive tax incentives for operations with 25% shares.

- FDI in targeted areas can be approved by provincial governments, thus saving the time and hassle of dealing with the central bureaucracy.

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[15] Xeng Huaqun, "Legal developments of FDI admission into China, *China Mail*, vol 13, no.1, January-March 2000, p. 48.

[16] Op. cit. p. 35-37.

[17] "China attracts FDI with new incentives and market access", Ibid. p. 37.

- Restrictions on sole foreign ownership and equipment appraisals of imported equipment will be selectively removed.
- FDI firms operating on leased land will be exempt from paying land use fees.
- MNCs will have more opportunity to sell products through their local ventures, and allow them to handle logistics within China.

China now encourages multinationals to set up R&D centers in China. Research centers set up by foreign investors in China can be exempt from import duty and import tax on equipment, auxiliary technologies, accessories, and components for their own use that cannot be sufficiently supplied in China. Transferred technologies are exempt from business tax, in accordance with the policy on domestic scientific research institutes. Foreign-invested enterprises, whose input in technological development is 10% higher than in the previous year, are allowed to use 50% of the actual amount of technological development to off set their tax that year.

Restructuring FDI Priorities

The rules for foreign direct investment have been revised to open up investment in more sectors. Currently, nearly 60 percent of China's foreign industrial investment goes to its consumer-goods industry, with the remainder going to the country's heavy industry. The State Development Planning Commission (SDPC) has decided that China's allocation of foreign capital should be roughly 20 percent for its primary industry, 50 percent or less for its secondary industry, and 30 percent or more for its tertiary industry. These figures apply for 2001-05, or even for 2001-10. While sole foreign investment reached 38.7% in 1999, this shift in policy is expected to increase the percentage of sole direct foreign ownership in China (Table 1-2).

Tax reforms and local fees and charges have caused some confusion and made it difficult for foreign firms to predict their actual tax liabilities. For example, foreign firms are now required to pay 25% in retirement fees on expatriates' worldwide salaries, though maximum retirement payments are only 250 yuan per month (approximately US$30).

Table 1-2: Patterns of Foreign Direct Investment in China	1998		1999	
	Amount (US$100 millions)	%	Amount (US$100 millions)	%
Direct foreign investment	US$454.63	100	US$402.98	100
Of which, Joint-Invested Operation	183.48	40.36	158.44	39.2
Cooperative Operation	97.19	21.38	82.15	20.3
Sole Foreign-Invested Operation	164.70	36.23	156.27	38.7
Foreign-Invested Shareholding Company	7.07	1.55	2.92	0.7
Cooperative development	1.79	0.39	3.84	0.1
Other	0.40	0.09	0.37	0.09

Source: *ChinaOnline* News, June 1, 2000

The National People's Congress, in 1991, adopted the " Income Tax Law for Enterprises with Foreign Investment and Foreign Enterprises¡±, and then the State Council enacted the "Detailed Rules for the

Implementation of the Income Tax Law for Enterprises with Foreign Investment and Foreign Enterprises", which stipulates that the income tax for enterprises with foreign investment is levied at a rate of 30%, local income tax at 3%, totally 33%. The income tax on enterprises with foreign investment established in Special Economic Zones and enterprises with foreign investment established in Special Economic Zones and enterprises with foreign investment of a production nature in the Economic and Technological Development Zones is levied at a reduced rate of 15%. Enterprises with foreign investment of a production nature established in coastal Economic and Technological Development Zones shall be levied at a reduced rate of 24%. Enterprises with foreign investment established in coastal economic open areas, in the old urban districts of cities where Economic and Technological Development Zones are located or in other regions designated by the State Council, within the scope of energy, communication, ports and harbors, wharfs or other projects encouraged by shall be levied at the reduced rate of 15%.

Any enterprise with foreign investment of a production nature, scheduled to operate for a period of no less then 10 years shall be exempted from income tax for the first and second year and allowed a 50% reduction in the third to the fifth years.

Export-oriented enterprises with foreign investment may, upon the expiration of the tax exemption and reduction period as provided for in the tax law, further enjoy the 50% reduction the corporate income tax based on the rate stipulated by the tax law, if the value of their export products of the year exceeds 70% of the total value of products of the year.

Enterprises with foreign investment shall be exempt from customs duties and value-added tax levied in the import links, to import equipment and materials needed for the establishment of factories, or offshore petroleum development projects.

PRIORITY 4: INCREASE SCIENCE AND TECHNOLOGY

A nation without good scientific and cultural quality
will be unable to get a foothold in world competition.
President Jiang Zemin

Under the Ninth Five-Year Plan, the Chinese State has established a goal of national economic construction and social development. As part of the State's role, training of high-caliber industrial workers in scientific knowledge will be strengthened. Scientific and technological advances and improving the quality of workers are considered to be the only solution for developing social productive forces, raising overall national strength, and improving the people's living standard. Spreading scientific knowledge is considered a social systems engineering project of far-reaching significance. Science and technology are considered the primary productive forces in making the country prosperous.

To support technological modernization, expenditures have increased from $10.8 billion in 1990 to nearly $24 billion in 1995. Investment in science and technology (S&T) amounted to $10 billion in 1995, or 0.5% of GDP. By 2000, the Chinese Government plans to triple the amount of R&D to 1.5% of GDP. Key objectives include the development of rural industries, the improvement of basic industries and infrastructures, the strengthening of export competitiveness, the development of advanced technologies, support of new industries and products developments, and the development of a supporting service sector. The top three priorities are to transfer technology into agricultural industries, to develop a national information infrastructure, and to improve factory automation processes.

China has a national commitment to develop advanced technologies, to encourage entrepreneurs, and to create linkages between technology and the economy. The 1996 five-year plan was based on interlocking strategies for technology, industry, and trade. It shifted the government's focus from supply-oriented research to market-oriented technology development and dissemination. Its objectives were to expedite technology into basic industries, to improve product quality and competitiveness through technological advances, to improve manufacturing processes, and to improve social welfare through disaster planning, and to protect

public health and the environment. The law on promoting transformation of science and technology achievements was promulgated on May 16, 1996 to facilitate technology activities. The law created a system for the government to manage domestic technology commercialization, to protect foreign and domestic intellectual property rights, to provide royalties to researchers for inventions, to protect trade secrets, and to support to technology-based transactions.

China borrowed program elements from around the globe for national models that employ technology to achieve economic development goals. Seven programs were established to more effectively transfer research into industrial production.

1. The State Science and Technology Commission's national key technology selection group established key technology R&D programs. They included the areas of information, manufacturing automation, advanced materials and biotechnology. The list included 24 key technologies and 124 specific technology items to address economic concerns.

2. The national basic research priorities program promotes international cooperation, technology exchange, education, and laboratories and equipment to support math, physics, chemistry, mechanics, astronomy, geology, and biology.

3. The 863 program for high technology research was to determine the feasibility of further investments in biotechnology, energy conservation, aerospace, mechatronics, advanced materials, information, and micro-electronic developments.

4. The Torch program addressed the commercialization of 863 developments by providing funds for production of key technologies, for renovating basic industries, and to promote international cooperation.

5. The Spark program was established to diffuse agricultural technologies through loans, information, and management training.

6. Technology diffusion programs were primarily directed at agriculture and related economic developments.

7. Trial production of new products and the appraisal of advanced technologies are concentrated in high-technology development zones (HTDZ).

The Hi-Tech R&D Program or 863 programs, initiated in March 1986, addressed seven priority development areas: biotechnology, space technology, information technology, laser technology, automation technology, energy technology, and new materials. The program operates under expert committees covering seven areas. The experts are responsible for directions and making decisions in plan formulation, project arrangement, fund use, etc. Research projects guidance for each subject is issued nationwide every two years.

The Torch program, initiated in 1988, provides guidelines for developing new high technology industries and established 27 new high-tech industrial development zones (Beijing, Wuhan, Nanjing, Shenyang, Tianjin, Xian, Chengdu, Weihai, Zhongshan, Changchun, Harbin, Changsha, Fuzhou, Guangzhou, Hefei, Chongqing, Hangzhou, Guilin, Zhengzhou, Lanshou, Shijiazhuang, Jinan, Shanghai, Dalian, Shenzhen, Xiamen, and Haikou). The Torch program set policies for reforming and opening up industries to the outside world, and promoting commercialization, industrialization, and internationalization. The Spark program was implemented in 1986 to facilitate rural industrialization, including raising the technical skills and management level of village and township enterprises, helping rural industries to develop by relying on advances in science and technology and raising the education level of the workers.

The National S&T Achievements Spreading Program was instituted in 1990 to put advanced, appropriate and mature S&T achievements into the nation's economy. The Trial Production and Appraisal Program attempts to further link science and technology with the economy through new product development and production. New products are classified as state level or regional level. New products developed and produced nation wide for the

first time are state-level new products. New products developed and produced for the first time in a province, autonomous regions or municipalities are regional-level products. The National Tax Bureau formulates and publicizes the list of new state-level products whose taxes are reduced or remitted.

Implementing 863 Research Results

The first industrialization base for research results of National 863 Program was officially put into operation on Feb. 26, 2000 in Shenzhen. This is a new initiative after 14-year implementation of National 863 Program. Li Xueyong, Vice Minister of Science and Technology, said the Central Government has made a new plan for accelerating the industrialization process of high level research results while steadily promoting the implementation of Phase II 863 projects. The Ministry of Science and Technology has formally approved the first 16 enterprise bases for the application of scientific research achievements from the "863 Program" high-tech R&D projects.[18] The bases are as follows:

1. Shenzhen Kexing Biology Product Company Limited;
2. Beijing Zhong Zi Hanwang Science and Technology Company;
3. Dongfang Software Company Limited;
4. China Great Dragon Information Technology Company Limited;
5. Langchao Information Industry Company Limited;
6. Fenghuo Communications Science and Technology Company Limited;
7. Datang Telecom Science & Technology Company Limited;
8. Wuhan Huazhong Numerical Control System Company Limited;
9. Shenyang Xinsong Machine Automation Company Limited;
10. Zhong Liao San Pu Battery (Shenyang) Company Limited;
11. Guangdong Fenghua High and New Science and Technology Group;
12. Tianjin Heping Haiwan Real Estate Development Company;
13. Shenzhen Leidi Science and Technology Enterprise Company Limited;
14. Beijing San Huan New Materials High-tech Inc. (of CAS);
15. Shandong Tian Da Medicine Company Limited;
16. Shandong Rong Cheng Xun Shan Aquaculture Group Corporation.

Located in Shenzhen's "Biological Valley", Kexing is the largest high tech company producing biological products in the country. Jointly operated by Weiming Biological Group of Peking University and U.S. Handing Asia and Pacific Venture Investment Fund, its new product Sairuojin interferon is the first industrialized biological product in China's 863 Program and also the first genetic engineering drug approved by Ministry of Health for its mass production. The company is proud of its first class scientists' team headed by Dr. Chen Zhangliang and experienced senior management team. At present, the company has an annual capacity for 20 million interferon capsules, 60% of the domestic market.

It is reported that after being named as an industrialization base for 863 research results, Kexing is planning to expand by constructing the so-called Shenzhen Peking University Biological Valley. With its major products centered around hot genetic engineered products such as interferon, insulin, sinalbin-I and sinalbin-

[18] Reported in *Keji Ribao* (Science & Technology Daily). January 27, 2000.

II and human growth hormone, the new biological valley expects an investment of RMB 300 million for its Phase One project among its total investment of RMB 700 million.[19]

Ministry of Science and Technology Oversight

The Ministry of Science and Technology (MOST) oversees the Department of Industrial Technology, the Department of International Cooperation, and the Department of Science and Technology Restructuring. The Department of Industrial Technology oversees 1) the 863 program for advanced technology development, 2) the Torch program for technology deployment and commercial feasibility of 863 programs, and 3) the productivity promotion centers responsible for rural industrial development.

In January 2000, MOST announced the new 863 programs that included the following 50 projects:

1. R&D of reagent packages for detecting the antigens of the Hepatitis C Virus (HCV) and the AIDS virus (HIV);
2. R&D of the growth factors for restructuring human alkaline fibroblast;
3. R&D of the activators for restructuring human urinary fibrillolytic zymogen;
4. R&D of the immunity-building drugs against liver cancer;
5. Use of genetic engineering for saccharomycetes and vegetative acid enzymes in the manufacture of feed;
6. R&D of new disease-resistant wheat strains (Yangmai Nos. 9 and 10, and Shengkang No. 1);
7. Implementation of the breeding project for Xiangyun crucian carp;
8. R&D of storage-resistant tomatoes with transferred genes;
9. Industrialization of the production of insect-resistant cotton;
10. Industrialization of the manufacture of genetic engineering drugs for restructuring human insulin and growth hormones;
11. Demonstration projects for the internationalization of the software industry;
12. R&D of key photo-electronic components and target products;
13. R&D of 16´ 10 Gb/aSDH wavelength division multiple access (WDMA) systems;
14. Application demonstration of intelligent agricultural information technologies;
15. Development of a high-performance computing environment;
16. Development of the third generation of mobile communications;
17. Development of digital equipment and products;
18. Construction of industrial bases for the transformation of the scientific research achievements in photo electronics;
19. Demonstration and presentation systems for the key geo-survey technologies and applications;
20. Development of domestic high-speed information demonstration networks;
21. Development of integrated platforms and framework systems supporting the rapid implementation of CIMS;
22. Engineering and industrialization of open structure intelligent numerical control systems
23. Development of rapid punching machines (RPM);

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[19] *Development Targets of High Tech Development Zones Materialized Ahead of Schedule*, CHINA SCIENCE AND TECHNOLOGY NEWSLETTER (The Ministry of Science and Technology People's Republic of China) N. 218, March 30, 2000.

24. Development of database management systems;
25. Development of enterprise resource planning management systems (ERP);
26. Server profiling automatic spraying and painting systems with high-speed rotary cups;
27. Development of robotic automatic spraying and painting systems for TV casing;
28. Industrialization and application engineering of arc-welding robots;
29. Development of automatic packing robots and piling production lines;
30. Development of NiH batteries;
31. Development of board electronic components;
32. Industrialization of the manufacture of high-grade ferro-neodymium borate (Nd-Fe-B) rare-earth permanent magnetic materials;
33. Industrialization of the manufacture of organic optical cylinders;
34. Development of new technological processes for the colloidal forming of high-performance ceramics;
35. Development of lithium ion batteries;
36. Rolling of aluminum-stainless steel composite strips in semi-solid states;
37. Development of aluminum oxide ceramic plates;
38. Development of ferro-neodymium borate ((Nd-Fe-B)) magnetos;
39. Industrialization of the manufacture of hydrogen-containing alloys;
40. Continuous production of foamed nickel;
41. Polyploid seedling growing, breeding and aquaculture of saltwater animals;
42. Development of technologies for the manufacture of highly efficient pelletized feed series for the breeding of aquaculture;
43. Network wide area differential GPS;
44. Development of multi-functional, acoustic ocean-current section-meter for vessels;
45. Industrialization and application of the scientific research achievements for the new anti-tumor drug K-001;
46. Industrialization of the manufacture of the new ecological farm chemical “Nong Le No. 1” and development of the product series;
47. Popularization and application of the technologies for producing healthy prawns;
48. Development of eight-armed dip meters;
49. Technologies and demonstration experiments for the three-dimensional automatic monitoring systems for the marine environment;
50. Industrialization of the comprehensive utilization of oysters.

The Department of Science and Technology Restructuring has responsibility for renovating the state owned enterprises in cooperation with the State Economic and Trade Commission. State owned enterprises had lacked market-driven initiatives and duplicated research efforts. Specific companies were targeted to implement new technologies and management methods to improve their operations and competitiveness.

The Chinese Academy of Science was responsible for state key laboratories and engineering and research centers (ERC) that included 55 state key laboratories and 14 engineering and research centers.

The Ministry of Information Industry was formed to integrate the Ministry of Electronics Industry and the Ministry of Posts and Telegraph. The primary concern was to ensure that electronics manufacturing and Internet capabilities were meeting the needs of China’s industrial development plans. Without equivalents to

Samsung Electronics and Goldstar Semiconductor companies that transformed South Korea's electronics investments into a world-class semiconductor industry, foreign dependence is hard to avoid.

GOLDEN PROJECTS: BUILDING THE INFORMATION INFRASTRUCTURE.[20]

To modernize the information technology infrastructure, the Government is developing an economic information and data communications network spanning 500 cities and 12,000 large enterprises. China's telecom market is already booming, and the Internet is catching on fast. Duncan Clark, who runs Beijing-based consultancy BDA China, says China now has more than 100 million fixed-line subscribers, 80 million pager users (the world's biggest market), and 40 million mobile-phone subscribers. China also has one of the world's biggest cable networks, with 80 million subscribers packed into easy-to-service high-rise apartments. This year the number of Internet subscribers tripled, to 6.7 million. Clark predicts that by 2003 that number will rise to 34 million.

China's first move to build a national information infrastructure was the initiation of what were known as the Golden Projects. The Chinese Government established three Golden Projects in the early 1990s that were scheduled for completion by 2003. In December 1993, the creation of a high-level leading committee under the State Council, known as the Joint Committee of National Economic "Informatization," officially launched the projects with three overarching goals:

- To build a national information highway as a path to modernization and economic development.
- To drive development of information technology in China.
- To unify the country by tying the center to the provinces and by allowing the Government to act across ministerial and industrial demarcation lines.

These three goals overlap, but are significantly different in nature. The first is concrete — an information infrastructure over which data can flow. The second is emotional — a cry for the country to become a modern nation. The third is a combination of goals one and two: it is clearly the most important, and the driver of the other two. Realizing it will allow the Central Government to reacquire administrative control by being able to act as an information gatekeeper for the country.

Initially, the Golden Projects consisted of three elements: Golden Bridge, Golden Card and Golden Gate.

- **Golden Bridge** is the infrastructure for "informatizing" the national economy. At its core is a project to build the infrastructure backbone over which other information services will run. First proposed in March 1993 by then vice-premier Zhu Rongji, it has been built as a hybrid network combining satellite and landline networks. Tying together its 30 provincial and regional nodes is a network center in Beijing. So far the Golden Bridge Network has been constructed as a medium-speed "information highway", but its goal is to implement a wide bandwidth multimedia network over which other Golden projects can transmit and receive data.

- **Golden Card**, an electronic money project, is linked with President Jiang Zemin's June 1993 call for accelerating the development of banking and credit card systems in major cities within China. The project aims at setting up a credit card verification scheme and an interbank, inter-region clearing system. One of its key goals was to have 200 million credit cards in use across 400 cities within China by 2000 — a lot sooner than many observers anticipate.

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[20] Peter Lovelock, *E-China: Putting Business on the Internet*, Maverick Research Inc., October 29, 1999. (www.virtualchina.com).

- **Golden Gate** was first proposed in June 1993 by then vice premier Li Lanqing. It is a foreign trade information network aimed at improving import-export trade management by linking the Ministry of Foreign Trade and Economic Cooperation and the Customs Bureau. Before 1978, only the foreign trade ministry and its 12 trade corporations were permitted to engage in international trading activities. By the early 1990s, the Open Door policy had resulted in more than 9,000 organizations providing international trade services. The Golden Gate Project is designed to develop an information network to re-centralize administration and control of China's foreign trade activities.

Since the initial three golden projects were proposed, a series of other programs have emerged and been implemented. While the agenda of the initial projects was the implementation of information networks, these later projects have generally involved user-driven applications designed to use the information infrastructure to promote economic reform. With most of these Golden applications, government agencies are attempting to both increase economic efficiency and centralized control of information (Table 1-3). Two are particularly worthy of note. The Golden Sea Project, despite receiving little publicity, exemplifies the leadership's interest in information networks. It interconnects China's top government leaders and provides them with immediate access to reference data from other institutions, organizations and offices under the direct jurisdiction of the Communist Party Central Committee. Launched in 1994, it was the first Golden Project to be finalized (it was up and running by 1995). Among the organizations it brings together are the State Statistical Bureau, People's Bank of China, and the State Information Center.

The other is the Golden Intelligence Project, better known as CERNET: the China Education and Research Network. CERNET was the vehicle for the Internet's entrance into China. Initially funded with Rmb80 million (US$9.6 million) of seed money fom the Central Government, it will ultimately interconnect all campus networks with each other and into the international Internet. There is a certain irony in the Government allowing the very group of people which fomented the pro-democracy movement of April to June 1989 — the academic community in general, and students in particular — to be the first to gain access to the Internet.

Figure 1-5: China bandwidth

Total Bandwidth (million bits per second)	
ChinaNet	195
GBNet	18
UNINET	12
CERNET	8
CSTNet	8

Source: CNNIC

In addition to CERNET, three other data networks in China offer direct Internet access: China Science and Technology Network (CSTNet), Golden Bridge Network (GBNet) and China Telecom's ChinaNet (Figure 1-5). CSTNet is similar to CERNET, but smaller in scale: it connects subsidiaries of the Chinese Academy of Sciences. GBNet is the "other" network, run by JiTong, a state-owned company formerly linked with the now abolished Ministry of Electronics Industry.

ChinaNet is by far the most important of these four, since it is run by the operator of China's national public telephone network. Often referred to as the 163 network after the number users dial to gain access to it, it is the only part of the Internet in China with a legal Internet protocol address and a formal Internet domain name. This means it controls who can set up Web sites and which Web sites can be blocked. Although technical means exist for users with the know-how to find their way to blocked sites, fundamentally this means that China Telecom remains in overall charge of who accesses the Internet via the public telephone system.

Only ChinaNet and GBNet can sell Internet on commercial terms to other Internet service providers (ISPs), the companies that in most other parts of the world act as the link between a user and the Internet. Because China Telecom has the vast majority of the infrastructure in place, this in effect means that it is the monopoly supplier. All the 150 or so of China's ISPs are small and local, and China Telecom has shown no compunction to date in squeezing as much money from these businesses as possible. The result is that, while in the United States, line rental only accounts for 5% of an ISP's costs, in China the average is nearly 80%.

Even more restrictive is a China Telecom practice of linking line rental to the amount of revenue per line. Consequently, instead of rental declining with volume, it rises; making an ISP less profitable the more it increases its user base or usage. Given a playing field tilted so steeply against them, most independent ISPs have not only found it impossible to compete with ChinaNet, they have found it impossible to stay in

business without receiving some degree of assistance or lenience from China Telecom. As a result, although China saw a small blossoming of ISPs in 1997 and 1998 (many being small bulletin board service operations that decided to go commercial), many companies granted ISP licenses have stopped offering ISP services, or have been incorporated into the ChinaNet framework.

As a consequence, the majority of subscribers, whether companies, organizations or individuals, are connected with ChinaNet, either directly or indirectly. Educational users will of course access the Internet via CERNET, and those in the Chinese Academy of Sciences via CSTNet. The Golden Bridge Network, although offering Internet access to individuals, is still essentially a network in development and is being developed principally to service corporate accounts.

So, much as many people might like to think the Internet is part of a bottom-up explosion of individualism in China, it is not. It is instead a highly centralized network, largely running through a single carrier, China Telecom, and a monolithic infrastructure, China Telecom's public network, to carry data services to all other Chinese and foreign ISPs, companies and individual users.

The development of China's information superhighway requires coordination among more than 20 government ministries and hundreds of thousands of other organizations. The production and marketing information system was expected to link 360,000 state-owned enterprises and 8.6 million other firms with government offices to improve utilization of personnel, capital, and natural resources.

Table 1-3: Summary list of the Golden Projects

Name	Full Title	Major Ministries, Departments
Golden Bridge (JinQiao)	National Public Economic Information Communication Network	Ministry of Electronics, State Information Centre, Ji Tong Co.
Golden Card (JinKa)	Electronic Money Project	PBoC, Ministry of Electronics, Ministry of Internal Trade, Great Wall Computer Co.
Golden Customs (JinGuan)	National Foreign Economic Trade Information Network Project	Ministry of Foreign Trade, Customs Department, Ji Tong Co.
Golden Sea (JinHai)		State Statistical Bureau, PBoC, State Information Centre
Golden Macro (JinHong)	National Economic Macro-Policy Technology System	China ExIm Bank, Ministry of Finance, State Information Centre
Golden Tax (JinShui)	Computerized Tax Return and Invoice System Project	Ministry of Finance, Ministry of Electronics, National Taxation Bureau, Great Wall Computer Co
Golden Intelligence (JinZhi)	China Education and Research Network (CERnet)	State Education Commission
Golden Enterprise (JinQi)	Industrial Production and Information Distribution System	State Economic and Trade Commission
Golden Agriculture (JinNong)	Overall Agricultural Admin. and Information Service System	Ministry of Agriculture
Golden Health (JinWei)	National Health Information Network	Ministry of Health
Golden Info. (JinXin)	State Statistical Information Project	State Statistical Bureau
Golden Cellular (JinFeng)	Mobile Communications Production and Marketing Project	Ministry of Electronics Industry

Golden Switch (JinKai)	Digital 2000 Switch Systems Production Project	Ministry of Electronics Industry, Ministry of Posts and Telecoms

THE TORCH PROGRAM: NATIONAL HIGH TECH DEVELOPMENT ZONES

To promote the industrialization of China's high technologies and optimize industrial structures to spur economic development in the country, China has established 53 national high tech development zones in economically and technologically developed areas such as Beijing, Shanghai, Shenzhen, Xi'an and Suzhou. These zones were modeled on foreign techno parks. This process has been greatly encouraged through favorable policy and treatment offers. The management committee of the development zones are usually chaired by executive deputy mayors or even mayors, to demonstrate the importance attached to them by the local government.

Madame Zhu Lilan, Chinese Minister of Science and Technology, reported on March 16, 2000 that 53 national high tech development zones in the country had sustained a high growth trend last year by meeting their national targets one year ahead of schedule.

Madame Zhu added that 1999 revenues from technology, industry and trade and aggregate output values of these high tech development zones reached RMB 656 billion and 566 billion respectively, which were increases of 35% and 30% compared to the previous year. 17,900 enterprises located in national high tech development zones have created profits of RMB 35.6 billion, paid tax of RMB 27.5 billion, and earned foreign exchange through export of USD 10.6 billion. (This is a breakthrough of USD 10 billion for the first time in the high tech sector). As a result, the enterprises whose output value have exceeded RMB 100 million reached 800 in number including some well-known enterprises such as Legend, Haier, Hisense, Fangzheng.

Madame Zhu said the high tech development zones have become major industrial development bases for electronic information, new materials, biotechnology, integrated optical-mechanical-electronic system, new energy and environmental protection.

Successful Development Zone Strategies.

The purpose of economic development zones are to formulate preferential policies; improve the investment environment; raise funds; establish comprehensive support service systems, welcome research institutes, universities, enterprises and technical personnel to set up new establishments in the zone, create new high-tech enterprises, and develop new high-tech products and industries, providing funds by oneself, autonomous o's own g

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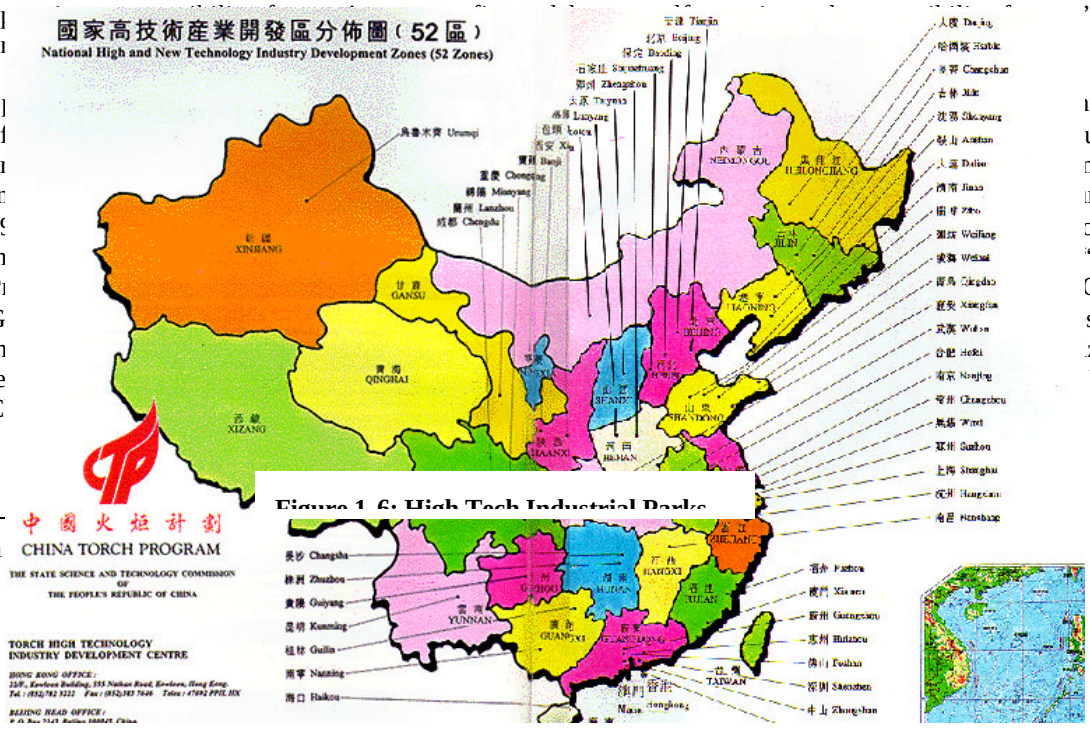

Figure 1.6: High Tech Industrial Parks

In the past few years, these industrial parks have earned an accumulative income of 193.03 billion yuan ($24 billion) from technology, industry and trade with a gross profit of 24.48 billion yuan ($3 billion), and implemented nearly 2000 projects under the national "Torch Program". And the major economic indexes of these parks have been doubling since 1991. Though national growth targets are uncertain and overall seven percent growth is suggested, economic zones focused on information technology such as Beijing's Haidian, Shanghai's Pudong and Guangdong's Shenzhen all predicted around fifteen percent growth for 1999 (Table 1-4).

The Government plans to create about 20 industrial zones in inland regions and to encourage enterprises from Shandong, Guandong and Jiangsu provinces to invest during the next five-year plan. Vice Premier Jiang Chunyun expects the plan to create five million jobs. Township enterprises in coastal provinces have already invested about $3.6 billion inland. However, the Central Government hopes to accelerate investment in western parts of the country and ease the tensions arising from economic disparity. The Government's plan intends to shift more capital-intensive industries into coastal areas as labor-intensive industries move inland. The Central Government's Agricultural Bank of China, along with other agricultural financial institutions, will provide loans for inland investments by village enterprises. At the same time, the Government is clamping down on local pollution of rivers by township enterprises.

Table 1-4: National High Technology Industry Development Zones

Beijing	Nanchang	Guiling	**Guizhou**
Beijing	**Heilongjiang**	Nanning	Guiyang
Fengtai	Daqing	**Shandong**	**Guangdong**
Changping	Harbin	Weihai	Feshan
Tianjin	**Shanghai**	Zibo	Tianhe
Tianjin	China Textiles	Weifang	Zhongshan
Heibei	Zhangjiang	Qingdao	Huizhou zhongkai
Shijiazhuang	Caohejing	Jinan	Shenzhen
Baoding	**Jiangsu**	**Henan**	Zhuhai
Shanxi	Suzhou	Luoyang	**Hainan**
Taiyuan	Wuxi	Zhengzhou	Hainan Intertional
Inner Mongolia	Nanjing	**Hubei**	**Yunnan**
Baotou Rare Earth	Changzhou	Wuhan Donghu	Kunming
Liaoning	**Zhejiang**	Xiangfan	Yunnan
Dalian	Hangzhou	**Hunan**	**Shanxi**
Shenyang Nanhu	**Anhui**	Zhuzhou	Xian
Anshan	Hefei	Changsha	Baoji
Jilin	**Fujian**	**Sichuan**	**Gansu**
Jilin	Fuzhou	Chongqing	Lanzhou
Changchun	Xiamen	Chengdu	**Xinjiang**
Jiangxi	**Guangxi**	Mianyang	Urumuqi

Source: torchina@chinatorch.com

The Chang Jiang Delta is one of China's economic powerhouses. One of the high-tech development zones in the area is Shanghai's Caohejing Hi-Tech Development Zone. It occupied 6 sq-km and has 500 companies of which 150 are funded from overseas. Major multinationals, such as AT&T, GE, 3M, ICI, Philips, Toshiba, and Dupont, have subsidiaries in the zone. High-tech firms in the zone are in micro-electronics, bio-engineering, new materials, automation meters, aviation, and space technology. Firms in the zone were shifting to increased value-added products through science and technology.

The Sharighai Jinqiao Export Processing Zone is 19 square kilometers located in the middle of Pudong New Area. The Pudong New Area also includes the Lujiazui Financial and Trade Zone, The Waigaoqioa Bonded Zone, and the Zhangjiang High-tech Park. It has undergone changes over the last five years as part of China's "opening-up" policies to the outside world.